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09/601,382	09/21/2000	Marc Rabarot	025219-272	2963

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EXAMINER

BLOUNT, STEVEN

ART UNIT	PAPER NUMBER
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2661

DATE MAILED: 02/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/601,382

Applicant(s)

Rabarov et al

Examiner

Blount

Group Art Unit

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—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- ☒ Responsive to communication(s) filed on 10/28/03
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 14-30 is/are pending in the application.
- Of the above claim(s) is/are withdrawn from consideration.
- ☐ Claim(s) is/are allowed.
- ☒ Claim(s) 14-30 is/are rejected.
- ☐ Claim(s) is/are objected to.
- ☐ Claim(s) are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
 - ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been received.
 - ☐ received in Application No. (Series Code/Serial Number) _____
 - ☐ received in this national stage application from the International Bureau (PCT Rule 1.7.2(a)).

*Certified copies not received: _____

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

Office Action Summary

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DETAILED ACTION

1. The restriction requirement made in paper number 20 is withdrawn, claims 14 - 30 pending and examined below.

Claim Objections

2. Claim 14 is objected to because of the following informalities: In line 3, "making microrelief" is missing the letter "a"; . Appropriate correction is required.

Claim Rejections - 35 U.S.C. § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 14 - 30 are rejected under 35 U.S.C. 112 second paragraph for failing to particularly point out and distinctly claim the subject matter which the applicant regards as their invention.

In claim 14 and the corresponding portions of claims 27 and 28, line 5, "and parallel to the substrate" is indefinite, since strictly speaking if it were move translationally and parallel to the surface, then it could not cut the surface, as it would only glide over it. Applicant should probably say "and perpendicular to the substrate", as this is what is shown in figure 5B.

In claim 14, line 4, "the substrate" lacks antecedent basis, and in line 6, "the thickness" also lacks antecedent basis.

In claim 27, line 4, "the substrate" lacks antecedent basis.

In claim 28, line 4, "the material" lacks antecedent basis.

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In claim 28, line 7, "from the remainder of the substrate" is indefinite. How is separated "from the remainder"? Figure 8A shows it is still attached to the substrate after cutting. Also, the preamble states that a microcomponent is formed in a substrate, but the last step says that the microcomponent is separated from the rest of the substrate. How can this be so?

In claim 29, line 3, "the substrate" lacks antecedent basis.

With regard to claim 30, in line 3, "the substrate" lacks antecedent basis.

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 14 - 30 are rejected under 35 U.S.C. 112 first paragraph for failing to be enabled by a specification which would enable one of ordinary skill in the art to make and use the invention.

In each of the independent claims, making a microcomponent with microrelief of optical quality by mechanical machining is claimed. It is stated on page 12 lines 12+ of the specification that the two stage process can be carried out in a single pass, and it is further stated on page 8 lines 6+ that you can obtain an optically polished finished in this manner, of "low roughness: about 1 um pv ("Peak to Valley").

The examiner does believe that this kind of low roughness can be achieved in a single pass with a finishing blade in the manner stated on page 12, lines 14+, utilizing a blank forming blade and a finishing blade.

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In European Patent Application 650803 to Lindholm, it is stated on page 2, lines 38+, that to obtain a R_{tm} of from greater than .40 to about .9 micrometers (R_{tm} is defined as “the mean of several peak-to-valley measurements”), you must go through two polishing steps requiring from one to two minutes per step. It is noted that the material being polished is an “optical quality surface” (abstract, line 1). This is, relatively speaking, vastly more work than accomplishing it in a single pass of a finishing blade.

Claim Rejections - 35 U.S.C. § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 14-18, 20, and 27-30 are rejected under 35 U.S.C. 103(a) as being obvious over the applicants admitted prior art (hereinafter referred to as AAPA) in view of U.S. patent 4,895,428 to Nelson et al.

With regard to claim 14, AAPA teaches problems in the prior art associated with forming microcomponents with the proper roughness in view of having to cleave the substrate until it is broken. See page 5, line 10 to page 6, line 10. AAPA does not, however, teach forming these microcomponents in a two step process including a first step of moving a tool “translationally

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and parallel” to the substrate wherein the mechanical machining is not carried out through the thickness of the substrate, and second step of cutting out the microcomponents.

Nelson teaches a two step process for forming *components* by “cutting grooves in two directions perpendicular to each other,” wherein the first set is described as: “One groove pattern is cut with an approximately 90 degree included angle symmetric tool” (col 6, lines 17+) which strongly suggests it does not teach moving a tool “translationally and parallel to the substrate” and a second step of cutting out the microcomponents: “the grooves in the other direction are cut with an offset tool forming a vertical side wall (face 28) and a relief surface (face 30)” (col 6, lines 19+).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have cut the *microcomponents* of AAPA utilizing the two step method taught in Nelson et al in order to provide them with a proper surface finish and accuracy.

With regard to claim 15, although a separate polishing step is not mentioned in Nelson et al, it is mentioned in AAPA on page 3 lines 23+ and it is also very well known in the art.

With regard to claim 16, see the rejection of claims 14 and 15 above.

With regard to claim 17, a single tool is mentioned in Nelson.

With regard to claim 18, using more than one tool is an obvious variation of using only one tool.

With regard to claim 20, the reliefs formed are essentially microprisms.

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With regard to claim 27, AAPA/Nelson teach making reliefs of optical quality as described above, and further teach cutting them out also as described above. While the microrelief vertical dimension range is not explicitly stated to be between 10 and 600 microns, one of ordinary skill in the art would realize that AAPA/Nelson could be used to form microreliefs with a wide range of vertical dimension values, including these.

With regard to claims 28 - 30, see the rejections above.

9. Claims 19, 21, 22, and 26 are rejected under 35 U.S.C. 103(a) as being obvious over the applicants admitted prior art (hereinafter referred to as AAPA) in view of U.S. patent 4,895,428 to Nelson et al as applied above and further in view of U.S. patent 5,582,536 to Kagamida.

With regard to claim 19, AAPA/Nelson et al teach the invention as described above, but do not teach a saw being used. This is taught in Kagamida. See figure 5. It would have been obvious to one of ordinary skill in the art at the time of the invention to have provided AAPA/Nelson with a "V" abrasive blade in light of the teachings of Kagamida, in order to facilitate easier processing of the microreliefs.

With regard to claim 21, see figure see figure 5.

With regard to claim 22, the faces are parallel.

With regard to claim 26, the member taught in figure 5 is essentially "u-shaped", a grindstone is used, and different sized grits is an obvious variation of only one size of grits.

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10. Claim 23 is rejected under 35 U.S.C. 103(a) as being obvious over the applicants admitted prior art (AAPA) in view of U.S. patent 4,895,428 to Nelson et al as applied above and further in view of U.S. patent 3,823,514 to Tsuchiya.

AAPA/Nelson teach the invention as described above, but do not teach the use of abrasive grits. This is taught in Tsuchiya.

11. Claim 24 is rejected under 35 U.S.C. 103(a) as being obvious over the applicants admitted prior art (hereinafter referred to as AAPA) in view of U.S. patent 4,895,428 to Nelson et al as applied above and further in view of U.S. patent 5,064,772 to Jambotkar.

AAPA/Nelson teach the invention as described above, but do not teach the use of etching. This is taught in Jambotkar.

12. Claim 25 is rejected under 35 U.S.C. 103(a) as being obvious over the applicants admitted prior art (hereinafter referred to as AAPA) in view of U.S. patent 4,895,428 to Nelson et al as applied above and further in view of U.S. patent 5,472,502 to Batchelder.

AAPA/Nelson teach the invention as described above, but do not teach the use planarizing coating. This is taught in Batchelder.

13. Claims 14, 27, 29, and 30 are rejected under 35 U.S.C. 103(a) as being obvious over U.S. patent 5,557,836 to Smith et al.

With regard to claim 14, Smith et al teaches forming microcomponents 135 with microreliefs 110, et al, by mechanical machining (see figure 16) such that the components are separated from each other, and though the tool is not moved "parallel" to the substrate, moving

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translationally is similar enough to this as to render this type of movement obvious. See also col 7 line 60 and col 10 lines 30+.

With regard to claim 27, see the above, and also col 1, lines 50+.

With respect to claims 29 - 30, see the rejection of claim 14 above.

14. Claim 28 is rejected under 35 U.S.C. 103(a) as being obvious over U.S. patent 5,557,836 to Smith et al in view of U.S. patent 3,254,556 to Staunton.

Smith et al teaches forming microcomponents in a substrate as described above, but does not teach separating them "from the remainder of the substrate" (IE, separating them into smaller pieces). Separating "microcomponents" into smaller groups of said microcomponents is taught in Staunton. See col 8 lines 40+.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have formed the microcomponents of Smith et al into smaller groups in light of the teachings of Staunton in order to provide a variety of sizes of microcomponents able to fulfill a variety of industrial needs, including optical reflectors (as taught in Smith et al) in different types (IE, sizes) of optical machinery.

15. Examiner Blount may be reached at 703-305-0319 Monday through Friday between the hours of 9:00 and 5:30.

SB
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1/24/04


KENNETH VANDERPUYE
PRIMARY EXAMINER